REMARKS

Claims 1-17 are the claims pending in the application. Claims 1-17 stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

I. Claims rejections - 35 U.S.C. Section 112, Second Paragraph Rejection

In response to the Examiner's comments, Applicant, as indicated above, has amended claims 10-17 consistent with the Examiner's recommendations.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Prior Art Rejections – 35 U.S.C. Section 102(b)

Claims 1-17 are rejected under 35 U.S.C. Section 102(b) as being anticipated by Stotts, et al. ("Stotts") ("Multiple Source Localization Using GPS Technology and Received Arrival Time Structure Analysis in an Air-Deployed System," IEEE Journal of Oceanic Engineering, Vol. 22, No. 3, July 1977). Claims 1-17 are rejected under 35 U.S.C. Section 102(b) as being anticipated by Landis ("Landis") ("Indian Head's IMPASS System Proves to be Right on Target," NAVSEA News Wire, December 13, 2002). Claims 1-17 are rejected under 35 U.S.C. Section 102(b) as being anticipated by Dunaway ("Dunaway") ("Virtual At Sea Training, presented at the National Defense Industrial Association, 7th Annual Artillery Symposium, Jun 19, 2002). Claims 1-7 are rejected under 35 U.S.C. Section 102(b) as being anticipated by either Erwin ("Erwin") ("Congress Ups Funding for Live-Fire Testing," National Defense Magazine, November

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2001) or Navy Newstand ("Navy Newstand") ("Navy and Air Force Hit Virtual Bull's

Eye at Sea," November 17, 2002).

A. The Rejection Based on Stotts

In summary, Applicant's accumulated error is calculated by summing a

residual value for each buoy generated from a calculated impact location based on real-

time data, whereas Stotts simply compares hypothetical calculations using incrementally

selected values against actual source location and travel time values as part of an error

analysis, without using real-time data, let alone summing residual values to produce an

accumulated error value.

In particular, regarding independent claims 1 and 9, Stotts fails to disclose, teach

or suggest the features of independents claims 1 and 9, and related dependent claims 2-8

and 10-17, including the location process includes a calculated accumulated error is

computed from a calculated impact location using real-time data entered into an equation

for the acoustic analysis system of each buoy where an output is a residual for the

equation. (See page 9, lines 3-13; Page 10, line 21-Page 11, line 4; and Figures 3A and

3B).

Indeed, Figure 2 of Stotts merely teaches a conventional method to locate

multiple impulsive sources in an ocean environment using a permutation model,

including an error analysis. In particular, the permutation model records data and uses

post-processing of the data to provide impact locations by comparing actual "leading

edge" times with modeled "leading edge" times until a location is found with somewhat

sufficient accuracy. Based on this non "real-time" approach, Applicant respectfully

submits that the Office Action mischaracterizes Stotts as disclosing calculating an

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accumulated error, let alone, an accumulated error using real-time data. (See Page 577,

Column 1, 4th Paragraph; Section II; and Figure 2).

To be sure, the Office Action only provides general not specific comments that

Stotts teaches an error analysis, which includes corrections for buoy drift (what the Office

Action attempts to analogize to Applicant's "accumulated error" calculation). In

particular, using modeling, Stotts only discloses that "impact simulations were also

performed to determine the effects of errors in the receiver locations." Random error on

each receiver was taken by shifting the direction of each buoy and calculating "the

maximum difference" from the source location. Further, errors in arrival times were also

determined by "adding error increments to the travel time on one given receiver" where it

was determined that "for every millisecond of error in arrival time, there was

approximately 1 m of error in the source localization."

Accordingly, these error factors are calculated based on inputting a number of

incrementally selected parameter values, for example, "the amount of shift was varied

from 1 to 10 M," to produce an output and comparing the output to the actual source

location and travel time values. Thus, Stotts simply compares hypothetically calculations

against actual source location and travel time values, without using real-time data, let

alone summing residual values for each buoy to produce an accumulated error value like

Applicant's invention. (See Office Action, Page 2-3, Section 5; and Stotts, Section IV,

Page 580, Column 2 – Page 581, Column 2).

Contrary to the assertion in the Office Action, the error analysis, including the

random error and error in arrival time calculations, are more structurally and functionally

equivalent to a hypothetical error factor using hypothetical calculations using

incrementally selected parameter values <u>not</u> an accumulated error computed from a calculated impact location using real-time data entered into an equation for each buoy as claimed by Applicant.

Accordingly, Stotts does not disclose or teach an accumulated error, let alone, an accumulated error calculated based on real-time data. Therefore, Stotts does not disclose, teach or suggest including <u>the location process includes a calculated accumulated error is computed from a calculated impact location using real-time data entered into an equation for the acoustic analysis system of each buoy where an output is a residual for the equation.</u>

In contrast, Applicant's invention includes the location process where an equation is derived for the acoustic analysis system 106 of each buoy 100 to determine the location of the buoys 100. The location for each buoy is further refined by re-calculating the location and generating an accumulated error using the derived equation based on residuals. In particular, an accumulated error is generated by summing the residual for each buoy. The residual for each buoy 100 is computed by a system controller 110 where a calculated impact location using real-time date for each buoy is entered into the equation to produce a residual output. As indicated above, the residual for each buoy is summed to produce the accumulated error.

Clearly, and for emphasis, Applicant's accumulated error is calculated by summing a residual values for each buoy generated from a calculated impact location based on real-time data, <u>whereas</u> Stotts simply compares hypothetical calculations using incrementally selected values against actual source location and travel time values as part

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of an error analysis, <u>without</u> using real-time data, let alone summing residual values to produce an accumulated error value.

Based on the above, Applicant traverses the assertion that Stotts discloses or teaches Applicant's invention of independent claims 1 and 9, and related dependent claims 2-8 and 10-17.

B.   The Rejection Based on Landis

In summary, Applicant's accumulated error is calculated by summing a residual values for each buoy generated from a calculated impact location based on real-time data, <u>whereas</u> Landis generally discloses an original IMPASS system <u>without</u> disclosing an accumulated error.

First, the current Office Action as well as the previous Office Action of August 27, 2004, only provide general <u>not</u> specific comments about rejecting Applicant's claimed invention. In particular, the current Office Action rejects claims 1-17 under Landis by referring back to the previous Office Action, which only <u>generally</u> indicates, "the disclosed system appears to set forth the identical system which is being claimed."

Indeed, as you are aware, the MPEP as well as case law provide that "it is incumbent upon the Patent Office ... to set forth clearly why it regards a claim to be anticipated. An examiner may <u>not</u> merely assert that a particular reference anticipates a claim." Further, to constitute an anticipatory reference, the prior art <u>must</u> contain an enabling disclosure. In addition, anticipation requires that a single source contain <u>all</u> of the essential elements of the claim. Accordingly, Applicant asserts that the Section 102(b) rejection under Landis, in both Office Actions, do <u>not</u> meet the prima facie burdens placed on the Patent Office. (See Office Action, Section 6 and 8; Office Action,

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PAGE 14/26 * RCVD AT 4/15/2005 6:58:59 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/3 * DNIS:8729306 * CSID:3017444423 * DURATION (mm-ss):08-46

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August 27, 2004, Section 5;   In re Mullin, 481 F.2d. 1333, 1336, 179 U.S.P.Q. 97, 100

(C.C.P.A. 1973); Helifix Ltd. v. Blok-Lok, Ltd., 208 F.3d 1339, 54 U.S.P.Q. 1299 (Fed.

Cir. 2000); Scripps Clinic & Research Fund v. Genentech, Inc., 927 F.2d at 1576, 18

U.S.P.Q. 2d at 1010 (Fed. Cir. 1991); and MPEP Section 2165.04).

Regarding independent claims 1 and 9, Landis fails to disclose, teach

or suggest the features of independents claims 1 and 9, and related dependent claims 2-8

and 10-17, including the location process includes a calculated accumulated error is

computed from a calculated impact location using real-time data entered into an equation

for the acoustic analysis system of each buoy where an output is a residual for the

equation. (See page 9, lines 3-13;   Page 10, line 21-Page 11, line 4; and Figures 3A and

3B).

Indeed, as discussed in the previous Office Action, Landis merely discloses a

summary of the original IMPASS system, including buoys, a global–positioning satellite

("GPS") system to locate impacts fired at a virtual target near the buoys, the GPS

provides precise positioning data of the buoys, and data is transmitted to a system

controller to "triangulate and display the impact locations of the round."

Further, Landis, by its own admission, discloses, in part, the limitations of the

original system, as "future plans call for a satellite up-link allowing for simultaneous and

faster operations." This statement clearly suggests that various further improvements are

forthcoming. These further improvements were included in Applicant's claimed

invention (see below). (See Landis, Paragraphs 6 and 7).

Accordingly, Landis merely teaches that the system controller is used in

triangulating the impact location not that the system controller computes a location of

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impact using a location process, let alone, that the impact location is further refined by

the location process, which includes an accumulated error calculated by summing a

residual values for each buoy generated from a calculated impact location based on real-

time data as claimed by Applicant. Since Landis does not disclose or suggest any

accumulated error, which is an essential element of the improved system, as disclosed

and claimed by Applicant, Landis does not contain an enabling disclosure. Therefore,

Landis does not disclose, teach or suggest including the location process includes a

calculated accumulated error is computed from a calculated impact location using real-

time data entered into an equation for the acoustic analysis system of each buoy where an

output is a residual for the equation.

In contrast, Applicant filed the above application on March 18, 2004, more than a

year after the December 13, 2002, Landis article. Significant technical inventive

improvements, and related structural changes, were made during this time period.

Applicant's invention is based on an improved IMPASS, in which major

improvements were made over the original IMPASS system disclosed in Landis. As

discussed above, Applicant's invention includes an accumulated error. Applicant

respectfully submits (and is also available in person to testify) that the accumulated error

is an improvement from the original system, and thus "accumulated error" was never

disclosed at the time of Landis, and thus it is not an obvious variant.

Indeed, as indicated above, Landis indicates that improvements were forthcoming.

To be sure, Applicant's disclosure indicates that "a major improvement over the initial

concept" is in an improved location process. "The improved location process also

includes an automatic calculation of a quality indicator defined in this application as accumulated error." (See Page 10, lines 7-12 and lines 21-23).

As discussed above, Applicant's claimed invention includes that the location process, which includes a calculated accumulated error is computed from a calculated impact location using real-time data entered into an equation for the acoustic analysis system of each buoy where an output is a residual for the equation

Clearly, and for emphasis, Applicant's accumulated error is calculated by summing a residual values for each buoy generated from a calculated impact location based on real-time data, whereas Landis does not disclose any accumulated error, let alone, the related residual values.

Based on the above, Applicant traverses the assertion that Landis discloses or teaches Applicant's invention of independent claims 1 and 9, and related dependent claims 2-8 and 10-17.

C.   The Rejection Based on Dunaway

In summary, Dunaway like Landis generally discloses the original IMPASS system without disclosing an accumulated error as well as other features disclosed in Applicant's invention.

First, the current Office Action as well as the previous Office Action of August 27, 2004, only provide general not specific comments about rejecting Applicant's claimed invention. In particular, the current Office Action rejects claims 1-17 under Landis by referring back to the previous Office Action, which only generally indicates, that the overall system design appears to be the claimed subject matter, and "all of the claimed limitations are deemed inherent."

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As discussed above, and for emphasis, the MPEP as well as case law provide that

"it is incumbent upon the Patent Office ... to set forth clearly why it regards a claim to be

anticipated. In addition, anticipation requires that a single source contain all of the

essential elements of the claim. Accordingly, Applicant asserts that the Section 102(b)

rejection under Dunaway, in both Office Actions, do not meet the prima facie burdens

placed on the Patent Office. (See above).

Regarding independent claims 1 and 9, Dunaway fails to disclose, teach

or suggest the features of independents claims 1 and 9, and related dependent claims 2-8

and 10-17, including the location process includes a calculated accumulated error is

computed from a calculated impact location using real-time data entered into an equation

for the acoustic analysis system of each buoy where an output is a residual for the

equation. (See page 9, lines 3-13; Page 10, line 21-Page 11, line 4; and Figures 1, 3A and

3B).

Indeed, Page 4 and 5 of Dunaway merely discloses, at best, a summary of the

original IMPASS system, including buoys, a global–positioning satellite ("GPS") system

to locate impacts fired at a virtual target near the buoys, RF signals from the buoys to the

the GPS, and a signal from the GPS to a controller. (See Dunaway, Pages 4 and 5).

In particular, Page 5 of Dunaway teaches that the buoys were recovered after use

of the system by manual computation of their location with regard to a nearby ship or

using radar. Conspicuously absent is an automated capability, that is, means, for the

system controller 110 to determine the location of the buoys 100 with respect to the

recovering ship as disclosed by Applicant. This feature is, in part, denoted by the dotted

line in Figure 1 of the Application. Accordingly, this feature is an improvement over the

"initial system concept" of the invention as disclosed by Dunaway. (See Dunaway, Page 4 and 5; and Applicant, Page 9, lines 15-18; and Figure 1).

Accordingly, Dunaway merely teaches that the system controller communicates with the GPS in capturing and calculating an acoustic signature of ordnance impacting the water. Dunaway does <u>not</u> disclose or suggest that the system controller computes a location of impact using a location process, let alone, that the impact location is further refined by the location process, which includes an accumulated error calculated by summing a residual values for each buoy generated from a calculated impact location based on real-time data as claimed by Applicant. Thus, Dunaway does <u>not</u> disclose or suggest any accumulated error, which is an <u>essential</u> element of the improved system, as disclosed and claimed by Applicant. Therefore, Dunaway does not disclose, teach or suggest including <u>the location process includes a calculated accumulated error is computed from a calculated impact location using real-time data entered into an equation for the acoustic analysis system of each buoy where an output is a residual for the equation.</u>

In contrast, Applicant filed the above application on March 18, 2004, almost two years after the June 19, 2002, Dunaway Presentation. As indicated above, significant technical inventive improvements, and related structural changes, were made during this time period.

Applicant's invention is based on an improved IMPASS, in which major improvements were made over the original IMPASS system <u>concept</u> disclosed in Dunaway. As discussed above, Applicant's invention includes an accumulated error. Applicant respectfully submits (and is also available in person to testify) that the

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accumulated error is an improvement from the original system, and thus "accumulated

error" was never disclosed at the time of the Dunaway presentation, and thus it is not an

obvious variant.

Indeed, as indicated above, Applicant discloses that "a major improvement over

the initial concept" is an improved location process. "The improved location process also

includes an automatic calculation of a quality indicator defined in this application as

accumulated error." (See above).

As discussed above, Applicant's claimed invention includes the location process,

which includes a calculated accumulated error is computed from a calculated impact

location using real-time data entered into an equation for the acoustic analysis system of

each buoy where an output is a residual for the equation

Clearly, and for emphasis, Applicant's accumulated error is calculated by

summing a residual values for each buoy generated from a calculated impact location

based on real-time data, whereas Dunaway does not disclose any accumulated error, let

alone, the related residual values.

Based on the above, Applicant traverses the assertion that Dunaway discloses or

teaches Applicant's invention of independent claims 1 and 9, and related dependent

claims 2-8 and 10-17.

D.   The Rejection Based on Erwin

In summary, Erwin generally discloses a prototype IMPASS system, which does

not disclose a system controller, let alone, an accumulated error generated by the system

controller as disclosed in Applicant's invention.

Regarding independent claim 1, Erwin fails to disclose, teach or suggest the features of independents claim 1, and related dependent claims 2-7, including the location process includes a calculated accumulated error is computed from a calculated impact location using real-time data entered into an equation for the acoustic analysis system of each buoy where an output is a residual for the equation. (See page 9, lines 3-13; Page 10, line 21-Page 11, line 4; and Figures 1, 3A and 3B).

Applicant agrees with the Examiner that the features of claims 8-17 are not taught by Erwin. In particular, the current Office Action, and the previous Office of August 27, 2004, do not rejection claims 8-17 under Erwin. (See Office Action, January 14, 2005, Page 4, Section 9; and Office Action, August 27, 2004, Page 3, Section 7).

Indeed, Erwin merely discloses, at best, a "prototype" IMPASS system, including buoys equipped with acoustic sensors and GPS satellite receivers where "the sensors connect the buoy to the ship and help plot the impact of where a round hits in the water."

Clearly, this brief description of the structure of the prototype IMPASS excludes many essential structural features of Applicant's invention, including a system controller, let alone, a system controller for computing a location of impact using a location process. Thus, Erwin does not disclose or suggest any accumulated error, which is an essential element of the improved system, as disclosed and claimed by Applicant. Therefore, Erwin does not disclose, teach or suggest including the location process includes a calculated accumulated error is computed from a calculated impact location using real-time data entered into an equation for the acoustic analysis system of each buoy where an output is a residual for the equation. (See Erwin, lines 15-25).

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In contrast, Applicant's invention, almost two and a half years after the Erwin

article, discloses, as indicated above, significant technical inventive improvements, and

related structural changes, made during this time period.

For emphasis, Applicant's invention is based on an improved IMPASS, in which

major improvements were made over the prototype IMPASS system concept disclosed in

Erwin. As discussed above, Applicant's invention includes a system controller 110 to

compute a location of impact using a location process, and the location process includes a

calculated accumulated error. The accumulated error "factor" is an improvement from

the original system, and thus "accumulated error" was never disclosed at the time of the

original system in the Erwin article, and thus it is not an obvious variant.

Indeed, as indicated above, Applicant discloses that "a major improvement over

the initial concept" is an improved location process. "The improved location process also

includes an automatic calculation of a quality indicator defined in this application as

accumulated error." (See above).

As discussed above, Applicant's claimed invention includes the location process,

which includes a calculated accumulated error is computed from a calculated impact

location using real-time data entered into an equation for the acoustic analysis system of

each buoy where an output is a residual for the equation

Clearly, and for emphasis, Applicant's accumulated error is calculated by

summing a residual values for each buoy generated from a calculated impact location

based on real-time data, whereas Erwin does not disclose any system controller, let alone,

any accumulated error, let alone, the related residual values.

Based on the above, Applicant traverses the assertion that Erwin discloses or

teaches Applicant's invention of independent claim 1, and related dependent claims 2-7.

E.   The Rejection Based on Navy Newstand

In summary, Navy Newstand generally discloses the original IMPASS system

without disclosing an accumulated error as disclosed in Applicant's invention.

Regarding independent claim 1, Navy Newstand fails to disclose, teach or suggest

the features of independents claim 1, and related dependent claims 2-7, including the

location process includes a calculated accumulated error is computed from a calculated

impact location using real-time data entered into an equation for the acoustic analysis

system of each buoy where an output is a residual for the equation. (See page 9, lines 3-

13; Page 10, line 21-Page 11, line 4; and Figures 1, 3A and 3B).

Applicant agrees with the Examiner that the features of claims 8-17 are not taught

by Navy Newstand. In particular, the current Office Action, and the previous Office of

August 27, 2004, do not rejection claims 8-17 under Erwin. (See Office Action, January

14, 2005, Page 4, Section 9; and Office Action, August 27, 2004, Page 3, Section 7).

Indeed, Navy Newstand merely discloses, at best, a summary of the original

IMPASS system, including buoys and a global–positioning satellite ("GPS") system to

locate impacts fired at a virtual target near the buoys through triangulation of the impacts

using two computers.

Further, Navy Newstand, by its own admission, discloses, in part, the limitations

of the original system, as "in the future, a satellite up-link will potentially allow over-the

horizon operations," "[a]s the system develops, planners hope to incorporate models

closely resembling geographic areas of interest," and, importantly, "more testing is

planned, [p]rovided the concept continues to be successful over the next six-month

evaluation period, the Navy plans to invest in as many as 10 additional systems by the

end of fiscal year 2003." These statements clearly suggest that various further

improvements are forthcoming. These further improvements were included in

Applicant's claimed invention (see below). (See Navy Newstand, Paragraphs 10, 11, 15

and 16).

Accordingly, Navy Newstand merely teaches that the system controller is used in

triangulating the impact location not that the system controller computes a location of

impact using a location process. Indeed, Navy Newstand does not disclose or teach that

the impact location is further refined by the location process, which includes an

accumulated error calculated by summing a residual values for each buoy generated from

a calculated impact location based on real-time data as claimed by Applicant. Thus,

Navy Newstand does not disclose or suggest any accumulated error, which is an essential

element of the improved system, as disclosed and claimed by Applicant. Therefore,

Navy Newstand does not disclose, teach or suggest including the location process

includes a calculated accumulated error is computed from a calculated impact location

using real-time data entered into an equation for the acoustic analysis system of each

buoy where an output is a residual for the equation. (See Erwin, lines 15-25).

In contrast, Applicant's invention, almost one and a half years after the Navy

Newstand article, discloses, as indicated above, significant technical inventive

improvements, and related structural changes, made during this time period.

Applicant's invention is based on an improved IMPASS, in which major

improvements were made over the original IMPASS system, which was the system

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disclosed in Navy Newstand. As discussed above, Applicant's invention includes an

accumulated error. Applicant respectfully submits (and is also available in person to

testify) that the accumulated error is an improvement from the original system and thus

"accumulated error" was never disclosed at the time of the Navy Newstand article, and it

is not an obvious variant.

Indeed, as indicated above, Navy Newstand indicates that improvements were

forthcoming.

To be sure, Applicant discloses that "a major improvement over the initial

concept" is in an improved location process. "The improved location process also

includes an automatic calculation of a quality indicator defined in this application as

accumulated error." (See above).

As discussed above, Applicant's claimed invention includes the feature of the

location process, which includes a calculated accumulated error is computed from a

calculated impact location using real-time data entered into an equation for the acoustic

analysis system of each buoy where an output is a residual for the equation

Clearly, and for emphasis, Applicant's accumulated error is calculated by

summing a residual values for each buoy generated from a calculated impact location

based on real-time data, whereas Navy Newstand does not disclose any accumulated

error, let alone, the related residual values.

Based on the above, Applicant traverses the assertion that Navy Newstand

discloses or teaches Applicant's invention of independent claim 1, and related dependent

claims 2-7.

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III. Formal Matters and Conclusions

In view of the foregoing, Applicants submit that claims 1-17, all the claims

presently pending in the application, are patentably distinct from the prior art of record

and are in condition for allowance. The Examiner is respectfully requested to pass the

above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for

allowance, the Examiner is requested to contact the undersigned at the local telephone

number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies, including the one month extension fee, and credit

any overpayment to Attorney's Deposit Account Number 50-1114.

Respectfully submitted,

Dated: 15 April 2005

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